

### **REMARKS**<sup>1</sup>

In the outstanding Office Action, the Examiner rejected claims 1-26 under 35 U.S.C. § 103(a) as being unpatentable over Lutta, Homomorphic Factorization of BRDF-based Lighting Computation, ACM – Transactions on Graphics, July, 2002, pages 509-516 (“Lutta”). By this amendment, Applicant has amended claims 1, 2, 5-15, 18, and 19. Claims 1-26 remain pending in this application.

Applicant respectfully traverses the rejection of claims 1-26 under 35 U.S.C. § 103(a). To establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), each of three requirements must be met. First, the reference or references, taken alone or combined, must teach or suggest each and every element recited in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of the three requirements must “ be found in the prior art, and not be based on applicant’s disclosure. ” See MPEP § 2143, 8th Ed. (Rev. 4), October, 2005. A *prima facie* case of obviousness has not been established.

For example, Lutta fails to teach or suggest an image processing apparatus or method including “calculating said reflectivity on a BRDF model calculated by a quadratic-form matrix expression,” as recited in claims 1 and 14 (emphasis added). The

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<sup>1</sup> The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement of characterization in the Office Action.

Examiner asserts that Lutta discloses this feature at page 510, col. 2, line 32 to page 511, col. 1, line 6. See Office Action, page 2. Contrary to the Examiner's assertion, however, the cited portion of Lutta actually discloses:

[t]he main goal of our approach is the factorization of the complete lighting function

$$L_o(\hat{v}, \hat{n}, \hat{t}) = \int_{\Omega} BRDF(\hat{\omega}(\hat{l}, \hat{n}, \hat{t}), \hat{\omega}(\hat{v}, \hat{n}, \hat{t})) L_i(\hat{l})(\hat{n} \cdot \hat{l}) d\hat{l} \text{ where}$$

$L_i(\hat{l})$  describes the amount of incoming light from direction  $\hat{l}$ .

Lutta, page 510, col. 2, lines 33-38 (emphasis added).

The cited portion of Lutta thus discloses factorization of the complete lighting function, not "calculating said reflectivity on a BRDF model," as recited in claims 1 and 14. Moreover, Lutta does not even disclose factorization of a "matrix expression." Rather Lutta discloses the factorization of the complete lighting function expressed in an integral expression, not a "matrix expression," as recited in claims 1 and 14.

Moreover, Lutta fails to disclose an image processing apparatus or method including "a quadratic-form matrix expression," as recited in claims 1 and 14 (emphasis added). The Examiner acknowledges that Lutta fails to disclose this feature, but attempts to cure this deficiency by asserting "it is well known in mathematical calculation, the approximation of BRDF can be taken in many forms . . . the mativation [sic] for using a 'quadratic-form' matrix is based on an acceptable view of approximation and processing time." Office Action, page 2. Even if the Examiner's assertion could be considered correct, there must be some motivation or suggestion, either in the prior art, or available to one of ordinary skill in the art, for making the proposed modification. See

MPEP § 2143. Here, there is no disclosure in Lutta that provides any reasonable suggestion for using a “quadratic-form matrix,” as Lutta is silent as to this feature.

To the extent that the Examiner may be asserting that the use of a “quadratic-form matrix” is old and well known, common knowledge, or is taking Official Notice, Applicants remind the Examiner that when relying on common knowledge, or taking Official Notice, to support a rejection under 35 U.S.C. § 103(a), “the Board [or examiner] must point to some concrete evidence in the record in support of these findings” to satisfy the substantial evidence test. *In re Zurko*, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697. Furthermore, if the Examiner is relying on personal knowledge to support the finding of what is known in the art, the Examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding. See 37 C.F.R. § 1.104(d)(2). If the Examiner maintains the rejection by relying on the position that “it is well known in mathematical calculation, the approximation of BRDF lighting function can be taken in many forms,” Applicant asks that the Examiner provide additional evidentiary evidence, either in the form of a reference or affidavit, to support this statement.

Lutta also fails to disclose an image processing apparatus or method including “calculating said reflectivity on a BRDF model calculated by . . . a matrix determining the characteristics of the BRDF model,” as recited in claims 1 and 14 (emphasis added). As above, the Examiner asserts that this feature is disclosed in Lutta at page 510, col. 2, line 32 to page 511, col. 1, line 6. See Office Action, page 2. However, as discussed above, the cited portion of Lutta merely discloses factorization of the

complete lighting function, expressed as an integral, and not a matrix. Moreover, Lutta is silent as to any matrix that determines the characteristics of the BRDF model, and thus fails to disclose “calculating said reflectivity on a BRDF model calculated by . . . a matrix determining the characteristics of the BRDF model,” as recited in claims 1 and 14 (emphasis added).

Because Lutta fails to teach or suggest every element recited in claims 1 and 14, a *prima facie* case of obviousness has not been established. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claims 1 and 14 under 35 U.S.C. § 103(a).

In addition, Applicant notes that Lutta is the only reference relied upon by the Examiner for this particular rejection. The MPEP sets forth that

[t]he distinction between rejections based on 35 U.S.C. 102 and those based on 35 U.S.C. 103 should be kept in mind. Under the former, the claim is anticipated by the reference. No question of obviousness is present. In other words, for anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present. Whereas, in a rejection based on 35 U.S.C. 103, the reference teachings must somehow be modified in order to meet the claims. The modification must be one which would have been obvious to one of ordinary skill in the art at the time the invention was made. MPEP § 706.02(IV).

The MPEP clearly instructs that, for a proper 35 U.S.C. § 103 rejection, “the reference teachings must somehow be modified in order to meet the claims.” Id. Therefore, if the Examiner applies a 35 U.S.C. § 103(a) rejection based on Lutta, he must articulate how Lutta must be modified to supposedly teach each and every claim element. As

discussed above, Lutta does not suggest the Examiner's proposed modification.

Moreover, the Examiner does not explain how or why Lutta must be modified, other than to make a generalized allegation that "the motivation [sic] for using a 'quadratic-form' matrix is based on an acceptable view of an approximation and processing time."

Office Action, page 2.

Moreover, "[i]t is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given fair opportunity to reply." MPEP § 706.02(j). The Examiner's rejections are not properly communicated, as there is no explanation of why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification to meet the elements of Applicant's independent claims.

The MPEP further instructs that,

[a]fter indicating that the rejection is under 35 U.S.C. 103, the examiner should set forth in the Office action:

(A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,

(B) the difference or differences in the claim over the applied reference(s),

(C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and

(D) *an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.* Id. (emphasis added).

In this rejection, the Examiner has not set forth "an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated

to make the proposed modification." *Id.* Accordingly, a *prima facie* case of obviousness has not been established for this reason also.

Claims 2-13, and 15-26 respectively depend from claims 1 and 14, and thus require all of the respective features recited in claims 1 and 14. As discussed above, Lutta fails to teach or suggest every feature recited in claims 1 and 14, and thus fails to teach or suggest every element required by dependent claims 2-13 and 15-26. Accordingly, a *prima facie* case of obviousness has not been established with respect to claims 2-13 and 15-26 also, and Applicant respectfully requests that the Examiner withdraw the rejection of claims 2-13 and 15-26 under 35 U.S.C. § 103(a).

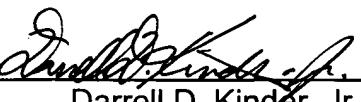
In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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